

**Via Electronic and Certified Mail**

February 26, 2015

Mr. Stephen Tzhone, Superfund Remedial Project Manager  
Superfund AR/LA Enforcement Section (6SF-RA)  
U.S. Environmental Protection Agency  
1445 Ross Avenue  
Dallas, Texas 75202

**Subject: Annual Report – 2014  
Arkwood, Inc. Site, Omaha, Arkansas**

Dear Mr. Tzhone:

Please see the enclosed 2014 Annual Report for the Arkwood, Inc. Site.

I certify that the information contained in or accompanying this submission is true, accurate, and complete to the best of my knowledge, information and belief, and that I, as project coordinator, have made reasonable inquiry into its veracity.

If you have any questions regarding this annual report, please do not hesitate to contact me at (608) 848-4134.

Sincerely,



Jean A. Mescher, Project Coordinator  
Director, Environmental Services

Enclosure

Copy:

- Mark Moix, ADEQ\*
- EPA Assistant Regional Counsel (6C-WA)\* (w/o enclosure)
- Chief, Superfund Enforcement Branch (6H-E)\* (w/o enclosure)

\* CERTIFIED MAIL



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**2014 ANNUAL REPORT  
ARKWOOD, INC. SITE  
OMAHA, ARKANSAS**

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**Prepared on behalf of:**

**McKESSON CORPORATION  
ONE POST STREET, 34<sup>TH</sup> FLOOR  
SAN FRANCISCO, CALIFORNIA 94104**

**Submitted By:**

**Oxford**

**Environmental and Safety, Inc.  
14348 NIEMAN ROAD  
OVERLAND PARK, KANSAS 66221**

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## **1.0 INTRODUCTION**

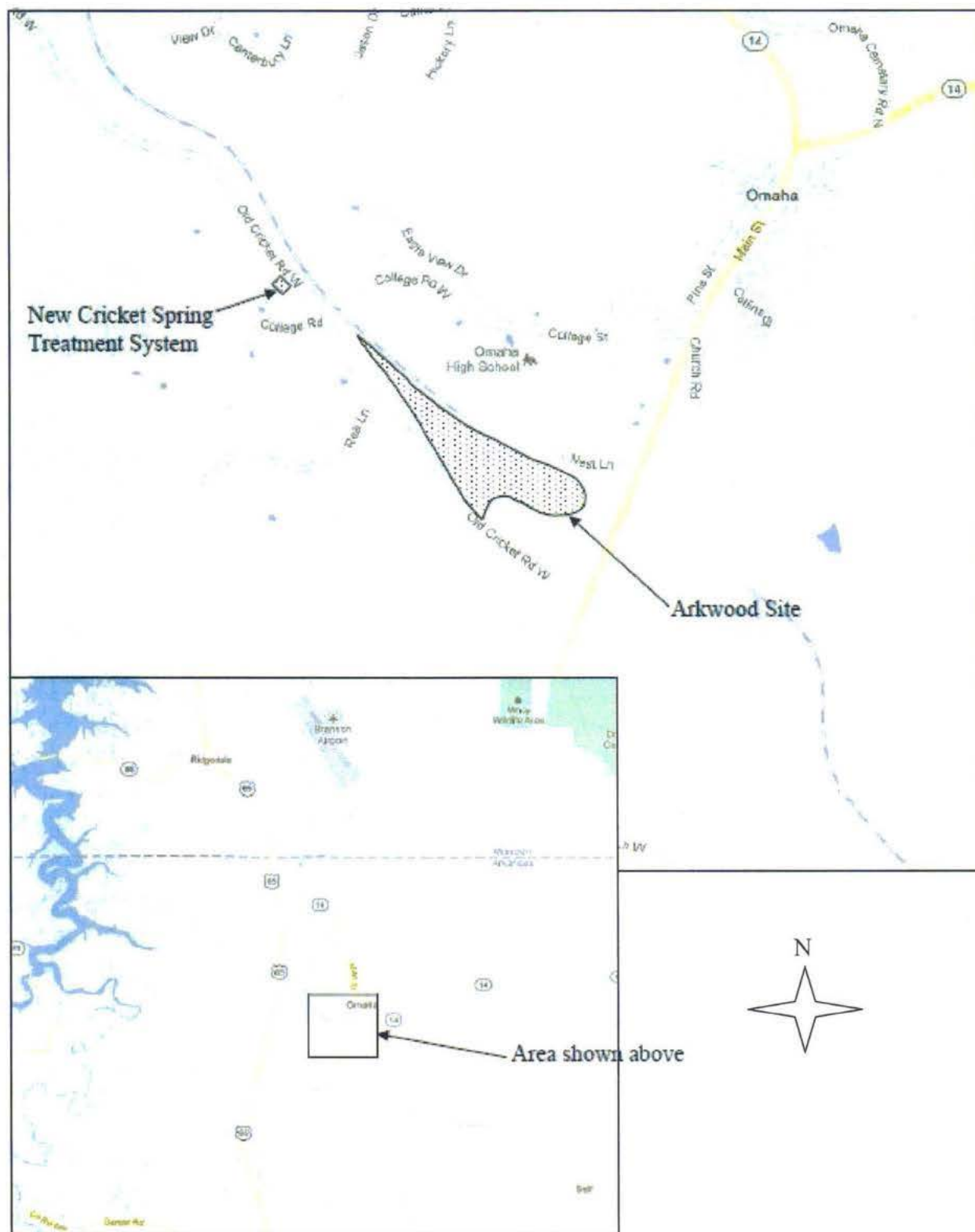
This report presents a summary of the activities at the Arkwood, Inc. Superfund Site (Site) for the time period of January 2014 to December 2014. The main portion of the Site is located northwest of the intersection of Old Highway 65 and Cricket Road in Omaha, Arkansas and southeast of the Missouri Pacific Railroad line (see Figure 1). Soil remediation for the Site was completed in 1995 as recognized by the USEPA and the State of Arkansas at the soil completion ceremony in July of 1996.

This Site is composed of an approximately 18-acre area where wood-treating and treated-wood storage occurred historically, a ditch along the railroad line, and the area within a 200 foot radius of the mouth of New Cricket Spring, which emerges approximately one-quarter mile down the valley from the Site and is impacted by pentachlorophenol (PCP). Following Site source removal and capping, a primary treatment system has operated since 1997 to treat the water emanating from New Cricket Spring prior to its discharge to a tributary to Cricket Creek.

A pilot water injection system was installed in late 2005 at the main portion of the Site. The pilot system was designed to inject groundwater or ozonated groundwater into the subsurface beneath the Site to a depth of approximately 25 feet to expedite treatment of residual PCP concentrations. The goal was to reduce the concentration of PCP emanating from New Cricket Spring and to maintain a more consistent flow to optimize primary treatment system operations. From approximately 2010 through September 10, 2012, the pilot water injection system was operated using non-ozonated water. After September 10, 2012, injection was discontinued so that New Cricket Spring could be monitored under natural flow conditions.

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**Figure 1.1**





## **2.0 RAINFALL**

Regional rainfall levels in 2014 decreased substantially from 2013 but were approximately six percent above the long term average annual rainfall. Regional rainfall in 2014 was approximately 12 percent below the level set in 2013. Annual rainfall for 2014 totaled 39.78 inches compared to the regional annual average rainfall of 37.58 inches. Rainfall by month and regional average rainfall by month are shown on Table 2.1 and Figure 2.1. Review of the data in Table 2.1 shows that the majority of the rainfall in 2012 fell in the first quarter of the year. The remaining three quarters reported below average rainfall. In 2013, most months of the year reported greater than average rainfall amounts except June and September which produced one-half or less of the normal amount of rainfall. In 2014, most months again produced greater than average rainfall amounts. However, the rainfall amounts reported for January, February and August which were significantly below average. Based on spring flow measurements, rainfall directly affects the observed flow rate in New Cricket Spring. If sufficient rainfall occurs that surface runoff develops, an increase in spring flow generally occurs within a few hours. Dependent upon the volume and duration of rainfall, the flow rate at New Cricket Spring tapers off over a period of a day to a few days to pre-precipitation flow rates.

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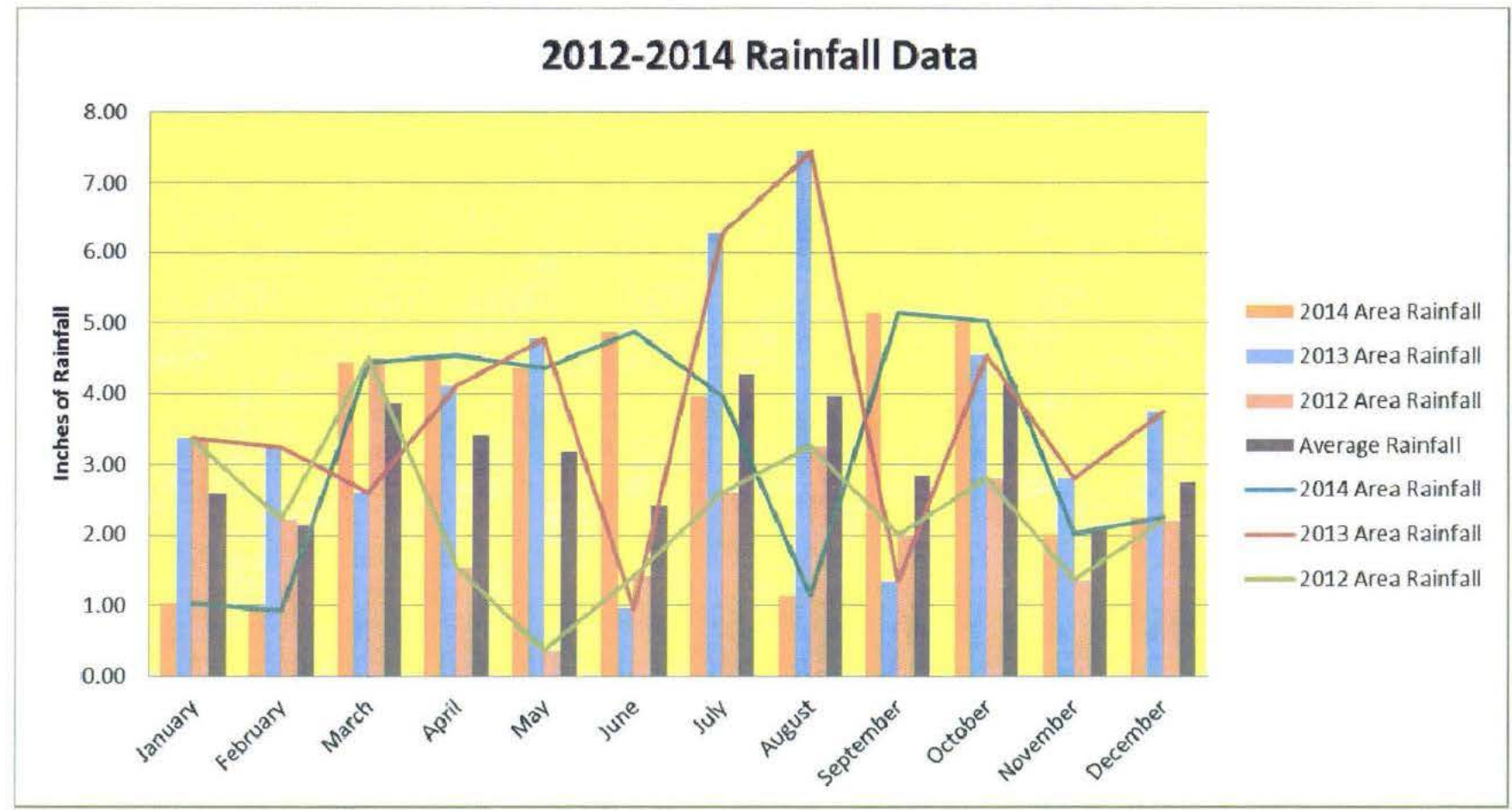
**Table 2.1**  
**RAINFALL 2012-2014**

<b>Month</b>	<b>2014 Area</b>	<b>2013 Area</b>	<b>2012 Area</b>	<b>Average</b>
	<b>Rainfall</b>	<b>Rainfall</b>	<b>Rainfall</b>	<b>Rainfall</b>
January	1.03	3.37	3.35	2.58
February	0.94	3.25	2.22	2.14
March	4.44	2.60	4.52	3.85
April	4.55	4.12	1.56	3.41
May	4.37	4.78	0.36	3.17
June	4.88	0.96	1.41	2.42
July	3.96	6.29	2.61	4.29
August	1.15	7.45	3.26	3.95
September	5.15	1.35	2.01	2.84
October	5.04	4.54	2.81	4.13
November	2.02	2.80	1.37	2.06
December	2.25	3.75	2.21	2.74
Total	39.78	45.26	27.69	37.58

*Reference*    [www.wunderground.com](http://www.wunderground.com)

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**Figure 2.1**





### **3.0 NEW CRICKET SPRING WATER FLOW**

As mentioned above, the water flow through New Cricket Spring responds fairly rapidly to the rainfall events reported in Section 2.0. New Cricket Spring water flow rates are recorded at the time of each sampling event. The reported monthly flow rates varied from less than one gallon per minute (gpm) (0.26 and 0.25 gpm) in August and September 2014, respectively, to 151.5 gpm in March 2014. New Cricket Spring water flows are presented in Table 3.1.

Figure 3.1 presents New Cricket Spring flow rates and the corresponding PCP concentrations at the mouth and weir (designated sampling points) recorded during the monthly sampling visits in 2013 and 2014. Figure 3.2 presents the pH, temperature and dissolved oxygen rates recorded at the treatment system discharge sampling point (weir) during 2013 and 2014.

The average flow at New Cricket Spring for the period from January to December 2014 was 24.72 gallons per minute. The 2014 average flow rate is greater (at least double) the average flow rates observed during the 2012 and 2013 time periods but is similar to the long-term average flow rate observed at the Site during the period from 1996 to 2013. New Cricket Spring flows for the years 1996 through 2014 can be viewed in Appendix A.

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**Table 3.1**

**New Cricket Spring**  
**Flow Rates (gpm) and PCP concentrations**  
**2014**

Date	Spring	PCP	
	Flow	Mouth	Weir
1/13/14	48.39	45.8	2.55
2/17/14	6.1	75.4	<1.00
3/17/14	151.5	12.8	2.47
4/23/14	11.26	49.4	<1.00
5/19/14	56.62	73.9	<1.00
6/4/14	2.45	65.7	<1.00
7/9/14	2.32	87.1	<1.00
8/14/14	0.26	47.6	<1.00
9/10/14	0.25	12.1	<1.00
10/22/14	2.02	137	<1.00
11/17/14	1.71	103	<1.00
12/16/14	13.86	45.9	<1.00

NOTES: Flow rates in gallons per minute (gpm)  
PCP concentrations in parts per billion (ppb)  
NA - not analyzed  
LE - Lab Error - samples not usable

**Figure 3.1**

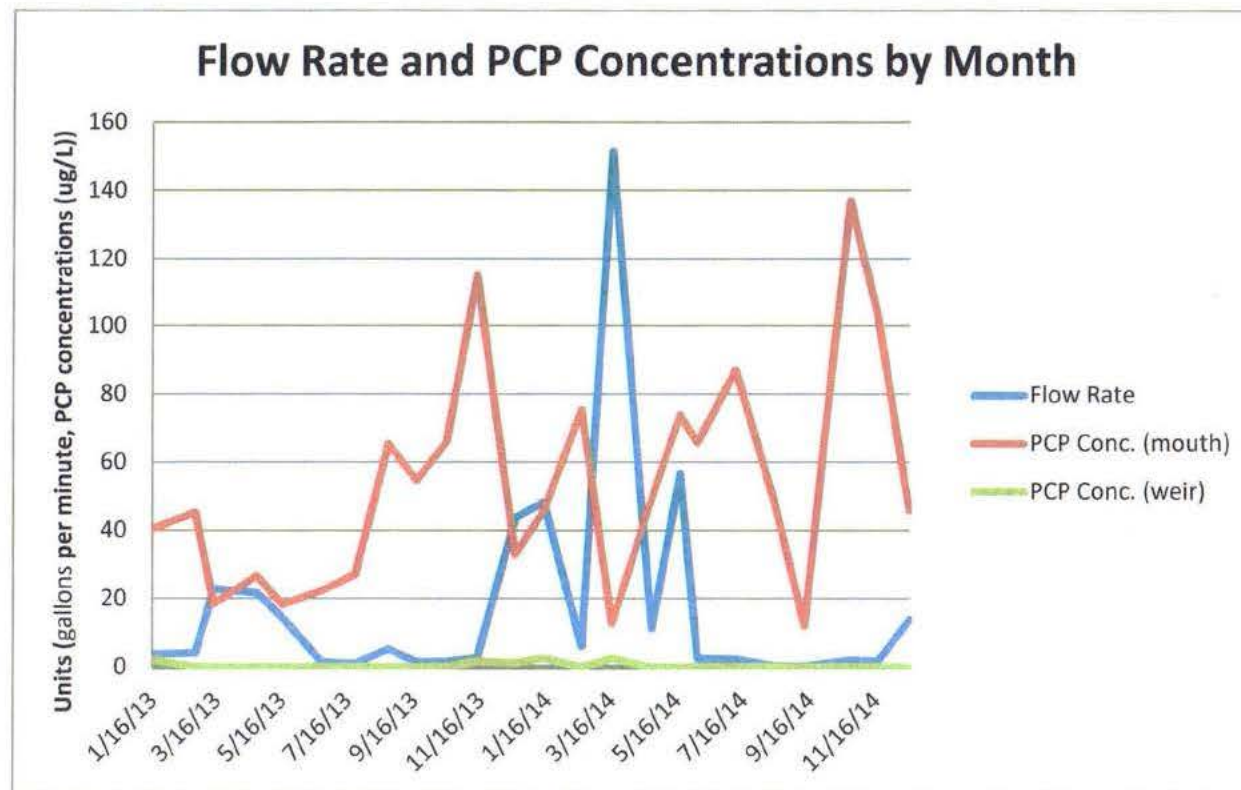
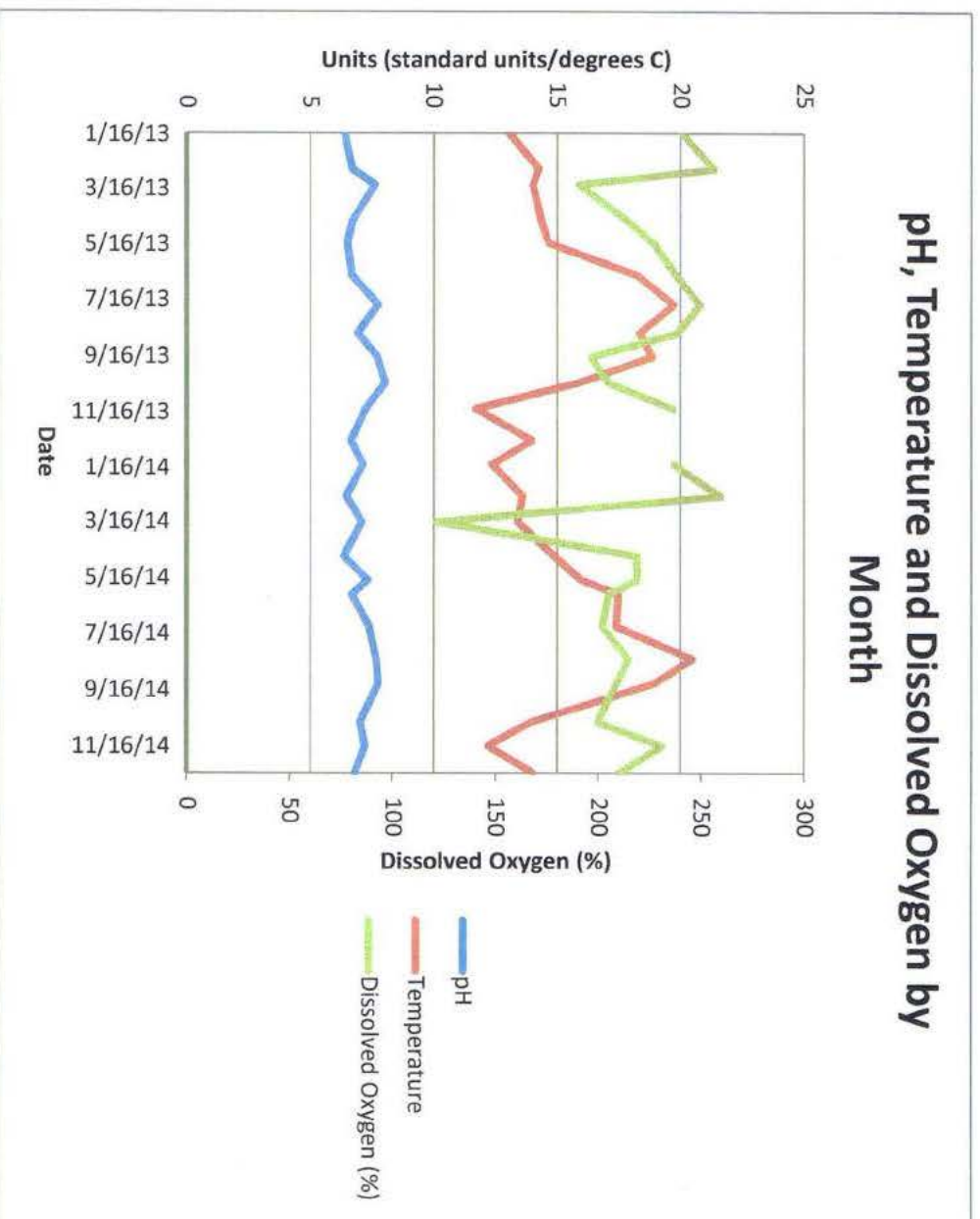


Figure 3.2





#### **4.0 ANALYTICAL DATA - WATER**

Water samples were collected for analytical testing on a monthly basis at the mouth of New Cricket Spring and from the discharge zone from the primary treatment system during 2014. From January through December, the primary treatment system discharge sample was collected from a point approximately twelve feet from the weir and within the discharge ditch prior to the discharge stream entering a drainage culvert. Water emanating from New Cricket Spring is treated with ozone in the primary treatment system before being released to a tributary to Cricket Creek. Analytical data collected during 2014 can be viewed in Table 3.1. Data from 2007 through 2014 is included in Appendix A.

Analytical results for PCP in water samples collected at the mouth of New Cricket Spring (pre-treatment) were reported above the cleanup levels for surface water during each month of 2014 except March and September and exceeded the groundwater cleanup levels during each month of 2014. Pentachlorophenol concentrations reported in samples collected at the mouth of the spring during 2014 ranged from 12.1 µg/L in September to 137 µg/L in October. The cleanup levels for the Arkwood site are an allowable monthly average of 15.57µg/L PCP and a daily maximum of 20.29 µg/L for surface water discharge and 1.00 µg/L for groundwater.

All PCP analytical data collected from the primary treatment system discharge zone (post-treatment) during 2014 were below the reported method detection limit for PCP of 1.00 micrograms per liter (µg/L) except the January and March 2012 samples, which were reported at 2.55 µg/L and 2.47 µg/L, respectively. All collected samples were submitted to Arkansas Analytical, Inc. of Little Rock, Arkansas for analysis for PCP using EPA method 8070D.

## **5.0 EQUIPMENT OPERATIONS**

Equipment operations consisted of operating the primary treatment system adjacent to New Cricket Spring, and maintenance of the facilities located at the Site. The primary treatment system continues to effectively treat the PCP that is present in New Cricket Spring prior to its discharge to a tributary to Cricket Creek. Table 3.1 includes a summary of the analytical data collected during this past year.

Routine maintenance and parts replacement occurred over the course of the year. No significant parts replacement was required and only minimal downtime was incurred associated with routine maintenance activities.

## **6.0 REVISED SITE BOUNDARIES**

During 2014, the Site boundaries incorporated in the deed restriction were re-defined in a Corrected Deed Notice and Restrictions resulting in re-classifying approximately 12 acres from the easternmost portion of the Site as no longer part of the deed restricted area. As a result, the property owner removed some fencing from the previous Site boundary. New Site boundary fencing in the form of a six-foot tall chain link fence was installed across a roadway that accessed the Site from the east and a steel cable fence was installed along the remaining eastern boundary. The steel cable fencing was utilized in these areas due to significant changes in terrain and the wooded nature of the Site boundary which would have required significant earthwork and tree removal to make the boundary amenable to chain link fencing. Caution signage was added to the new sections of steel cable and chain link fencing to provide warning regarding the nature of the Site.

## **7.0 SUPPLEMENTAL DYE TRACING**

On April 30, 2014, a Supplemental Groundwater Tracing Study Work Plan was submitted to the EPA and ADEQ for review. Final approval was received on October 21, 2014 and the study commenced on November 17, 2014. The study involved injection of two dyes into wells in the vicinity of the former sinkhole on the main site. Monitoring samples were collected at New Cricket Spring, Old Cricket Spring, water discharging from the south end of the railroad tunnel and the Walnut Creek valley. Final sample collection is scheduled for early 2015.



## **8.0 CONCEPTUAL SITE MODEL**

On April 29, 2014 and as a result of EPA's re-assessment of dioxin-impacted sites, a Revised Conceptual Site Model and Proposed Decision Unit Plan for the Arkwood, Inc. Site was prepared by Cardo ChemRisk. The revised model addresses polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/Fs) to evaluate risk assessment compliance of the remediated Site given recent changes in the toxicity criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). As a result of communications with the USEPA, Cardo ChemRisk proposed an approach for further soil sample collection to confirm PCDD/Fs concentrations for the decision units. The USEPA (2011) guidance for incremental composite soil sampling for PCDD/Fs was utilized to develop a set of seven areas designated as separate DUs, each of which was to be sampled using an incremental sampling methodology (ISM) comprised of composite samples of 30 to 40 increments. The analytical results from these composite samples are considered the representative soil concentration for each of the Decision Units (DUs) and Sampling Units (SUs) and will be used to evaluate risk assessment compliance for PCDD/Fs at the Arkwood, Inc. Site by comparing the maximum composite measurement for each DU/SU to the dioxin soil screening level.

### ***8.1 Incremental Soil Sampling***

On August 29, 2014, the Workplan for Implementation - Decision Unit Plan Sampling and Analysis was submitted to the EPA for review and comment. ISM methodology and guidance was used in developing the workplan. Upon conditional approval from the EPA, the workplan was implemented starting on October 20, 2014 and completing on October 28, 2014. A total of 26 samples were submitted to Vista Analytical Laboratory in El Dorado Hills, California for PCDD/F analysis using EPA method 1613. Analytical results are pending.

## **9.0 CONCLUSIONS**

The 2014 annual rainfall total was modestly above the historical average but below the rainfall total at the Site during 2013. In 2013, most months of the year reported greater than average rainfall amounts except June and September which produced one-half of less of the normal amount of rainfall. In 2014, most months again produced greater than average rainfall amounts; however, the rainfall amounts reported for January, February and August which were significantly below average. Low to very low natural flow rates were observed from June through November. Flow rates during these months were reported at approximately 2.5 gpm or less and approximately 0.25 gpm during August and September.

The primary water treatment system continued to effectively treat water collected from the mouth of New Cricket Spring, prior to its release into a tributary to Cricket Creek. New Cricket Spring will continue to be monitored under natural flow conditions. Monitoring at New Cricket Spring and the primary treatment system discharge will continue on a monthly basis during 2015 until EPA approves a reduction in frequency.

The Supplemental Dye Tracing Work Plan was implemented with the final sample collection scheduled for early 2015. A report of the findings will be prepared and submitted in 2015.

The development of the Conceptual Site Model and implementation of the ISM sampling program have been completed. Receipt and data validation of the ISM sample analytical results, as well as, development of the risk analysis based on the Conceptual Site Model are expected to be completed in 2015.



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**APPENDIX A      ARKWOOD      ANALYTICAL      DATA  
OCTOBER 2007 THROUGH 2014**

	Pilot Injection Flow	Pilot O3	NCS Flow gpm	NCS-PCP ppb	Weir PCP ppb
10/10/07	35	2-3lb/10g	18	5.63	1.15J
10/22/07	35	2-4lb/10g	18	1190	53.7
11/5/07	35	2-4lb/10g	18	209	7.93
11/19/07	35	2-4lb/10g	18	19.8	24.1
12/3/07	35	2-4lb/10g	18	20.1	<5.00
12/17/07	35	2-4lb/10g	32	87.4	1.20J
1/7/08	35	2-4lb/10g	23	<5.00	<5.00
1/21/08	35	2-4lb/10g	23	58	<5.00
2/4/08	35	2-4lb/10g	24	52	<5.00
2/18/08	35	2-4lb/10g	83	57	15
3/3/08	35	5-6lb/10g	580	<5.00	<5.00
3/17/08	35	5-6lb/10g	44	11	<5.00
4/7/08	35	5-6lb/10g	78	10	<5.00
4/12/08	35	5-6lb/10g	240	6.5	NA
4/13/08	35	5-6lb/10g	100	6.8	NA
4/14/08	35	5-6lb/10g	78	8.2	NA
5/10/08	36	5-6lb/10g	68	75	<5.00
5/27/08	0	0	18	189	<5.00
6/9/08	35	2-4lb/10g	30	77	<5.00
6/23/08	35	2-4lb/10g	580	5.6	<5.00
7/7/08	35	2-4lb/10g	80	194	189
7/10/08	35	2-4lb/10g	140	254	20
7/21/08	35	2-4lb/10g	42	477	<5.00
8/4/08	35	2-4lb/10g	22	108	14
8/18/08	35	2-4lb/10g	36	31	<5.00
9/1/08	35	2-4lb/10g	25	32	<5.00
9/22/08	35	2-4lb/10g	40	22	<5.00
10/6/08	35	2-4lb/10g	21	20	<5.00
10/20/08	33	2-4lb/10g	21	13	<5.00
11/3/08	35	2-4lb/10g	24	<5.00	<5.00
11/17/08	35	2-4lb/10g	30	28	<5.00
12/1/08	35	2-4lb/10g	24	12	<5.00
12/22/08	33	2-4lb/10g	24	<5.00	<5.00
1/5/09	35	2-4lb/10g	32	7.3	<5.00
1/26/09	32	2-4lb/10g	27	<5.00	<5.00
2/9/09	33	2-4lb/10g	90	<5.00	<5.00
2/23/09	33	2-4lb/10g	31	6	<5.00
3/9/09	34	2-4lb/10g	30	5.7	<5.00

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3/23/09	33	2-4lb/10g	30	<5.00	<5.00
4/6/09	32	2-4lb/10g	38	5.8	<5.00
4/20/09	32	2-4lb/10g	243	8.5	<5.00
5/4/09	33	2-4lb/10g	343	8.2	8.7
5/18/09	33	2-4lb/10g	51	6.2	<5.00
6/8/09	35	2-4lb/10g	38	<5.00	<5.00
6/29/09	33	2-4lb/10g	25	9.1	<5.00
7/20/09	32	2-4lb/10g	47	39	<5.00
8/10/09	32	2-4lb/10g	23.7	31	<5.00
9/13/09	32	0	22	8	<5.00
10/12/09	32	0	104	21	<5.00
11/9/09	32	0	45	<50	<5.00
12/7/09	32	0	28	8.2	<5.00
1/10/10	32	0	42	13	<5.00
2/15/10	32	0	87	11.1	<5.00
3/15/10	32	0	35	<5.00	<5.00
4/15/10	32	0	40	9.62	<5.00
5/17/10	32	0	180	11	<5.00
6/13/10	32	0	43	15	<5.00
7/8/10	32	0	33	66	<2
8/19/10	0-20	0	17	16.3	<5.00
9/21/10	34	0	33	28.2	<5.00
10/18/10	37	0	20	14.9	<10.00
11/20/10	37	0	21	4.89	<4.00
12/16/10	37	0	23.5	6.15	<5.00
1/18/11	37	0	22.8	3.39	2.86
2/9/11	37	0	26.8	10.4	<10.0
3/17/11	37	0	49.0	14.2	<5.00
4/19/11	37	0	57.5	12.5	<5.00
5/2/11	37	0	310	11	NA
5/3/11	37	0	271	8.92	NA
5/4/11	37	0	156	10.8	NA
5/4/11	37	0	123	15.8	NA
5/5/11	37	0	83	18	NA
5/9/11	37	0	33.9	43.8	<5.00
6/9/11	0	0	6.8	52.4	<5.00
7/18/11	0	0	0.6	18.6	<5.00
8/15/11	0	0	1.0	38.9	<5.00
9/13/11	0	0	0.1	<5.00	<5.00
10/18/11	0	0	23.7	52.4	<5.00
11/16/11	0	0	29.6	30.6	<5.00
12/19/11	0	0	60.2	11.5	<5.00
1/19/12	40	0	31.82	<5.00	<5.00
2/14/12	40	0	40.38	6.68	<5.00
3/29/12	40	0	50.81	7.95	<5.00
4/18/12	40	0	22.54	20	<5.00
5/23/12	40	0	18.18	10.9	<5.00
6/11/12	40	0	17.87	7.13	<5.15



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7/30/12	40	0	15.1	5.68	<5.00
8/24/12	40	0	13.75	<5.00	<5.00
9/24/12	0	0	0.4	73.2	<5.00
10/15/12	0	0	4.48	26.7	<5.00
11/19/12	0	0	0.73	28.8	<5.00
12/28/12	0	0	1.22	25	<1.00
1/16/13	0	0	3.72	40.5	2.12
2/24/13	0	0	4.1	45.3	<1.00
3/13/13	0	0	23	18.6	<1.00
4/22/13	0	0	21.62	26.7	<1.00
5/16/13	0	0	14.33	18.3	<1.00
6/21/13	0	0	1.44	22.3	<1.00
7/23/13	0	0	0.934	27.1	<1.00
8/23/13	0	0	5.27	65.4	<1.00
9/18/13	0	0	1.43	54.6	<1.00
10/16/13	0	0	1.63	66.1	<1.00
11/13/13	0	0	2.68	115	1.71
12/18/13	0	0	43.77	33	1.28
1/13/14	0	0	48.39	45.8	2.55
2/17/14	0	0	6.1	75.4	<1.00
3/17/14	0	0	151.5	12.8	2.47
4/23/14	0	0	11.26	49.4	<1.00
5/19/14	0	0	56.62	73.9	<1.00
6/4/14	0	0	2.45	65.7	<1.00
7/9/14	0	0	2.32	87.1	<1.00
8/14/14	0	0	0.26	47.6	<1.00
9/10/14	0	0	0.25	12.1	<1.00
10/22/14	0	0	2.02	137	<1.00
11/17/14	0	0	1.71	103	<1.00
12/16/14	0	0	13.86	45.9	<1.00

NOTES: Flow rates in gallons per minute (gpm)  
O3 injections rates in pounds per 10 gallons  
NCS – New Cricket Spring  
PCP concentrations in parts per billion (ppb)  
NA – not analyzed  
LE – Lab Error – samples not usable